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NATIONAL DAM SAFETY PROGRAM. WHITES DAM (INVENTORY NUMBER VA-00--ETC(U)
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Name of Dam: Whites Dam

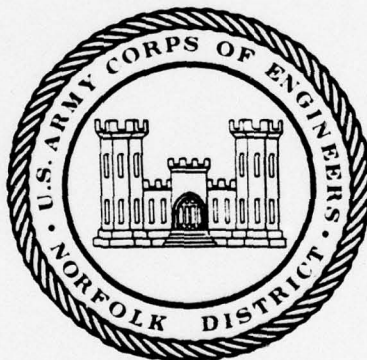
Location: Albemarle County, State of Virginia

Inventory Number: VA 00327

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PHASE I INSPECTION REPORT NATIONAL DAM SAFETY PROGRAM

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PREPARED FOR
NORFOLK DISTRICT CORPS OF ENGINEERS
803 FRONT STREET
NORFOLK, VIRGINIA 23510

PREPARED BY
MICHAEL BAKER, JR., INC.
BEAVER, PENNSYLVANIA 15009

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
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20. Abstract

Pursuant to Public Law 92-367, Phase I Inspection Reports are prepared under guidance contained in the recommended guidelines for safety inspection of dams, published by the Office of Chief of Engineers, Washington, D. C. 20314. The purpose of a Phase I investigation is to identify expeditiously those dams which may pose hazards to human life or property. The assessment of the general conditions of the dam is based upon available data and visual inspections. Detailed investigation and analyses involving topographic mapping, subsurface investigations, testing, and detailed computational evaluations are beyond the scope of a Phase I investigation; however, the investigation is intended to identify any need for such studies.

Based upon the field conditions at the time of the field inspection and all available engineering data, the Phase I report addresses the hydraulic, hydrologic, geologic, geotechnic, and structural aspects of the dam. The engineering techniques employed give a reasonably accurate assessment of the conditions of the dam. It should be realized that certain engineering aspects cannot be fully analyzed during a Phase I inspection. Assessment and remedial measures in the report include the requirements of additional indepth study when necessary.

Phase I reports include project information of the dam and appurtenances, all existing engineering data, operational procedures, hydraulic/hydrologic data of the watershed, dam stability, visual inspection report and an assessment including required remedial measures. 

PREFACE

This report is prepared under guidance contained in the Recommended Guidelines for Safety Inspection of Dams, for Phase I Investigations. Copies of these guidelines may be obtained from the Office of the Chief of Engineers, Washington, D.C. 20314. The purpose of a Phase I investigation is to identify expeditiously those dams which may pose hazards to human life or property. The assessment of the general condition of the dam is based upon available data and visual inspections. Detailed investigation and analyses involving topographic mapping, subsurface investigations testing, and detailed computational evaluations are beyond the scope of a Phase I investigation; however, the investigation is intended to identify any need for such studies.

In reviewing this report, it should be realized that the reported condition of the dam is based on observations of field conditions at the time of inspection along with data available to the inspection team. In cases where the reservoir was lowered or drained prior to inspection, such action, while improving the stability and safety of the dam, removes the normal load on the structure and may obscure certain conditions which might otherwise be detectable if inspected under the normal operating environment of the structure.

It is important to note that the condition of a dam depends on numerous and constantly changing internal and external conditions, and is evolutionary in nature. It would be incorrect to assume that the present condition of the dam will continue to represent the condition of the dam at some point in the future. Only through continued care and inspection can there be any chance that unsafe conditions be detected.

Phase I inspections are not intended to provide detailed hydrologic and hydraulic analyses. In accordance with the established guidelines, the spillway design flood is based on the estimated "Probable Maximum Flood" for the region (flood discharges that may be expected from the most severe combination of critical meteorologic and hydrologic conditions that are reasonably possible), or fractions thereof. Because of the magnitude and rarity of such a storm event, a finding that a spillway will not pass the design flood should not be interpreted as necessarily posing a highly inadequate condition. The design flood provides a measure of relative spillway capacity and serves as an aid in determining the need for more detailed hydrologic and hydraulic studies, considering the size of the dam, its general condition and the downstream damage potential.

PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM

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NAME OF DAM: WHITES DAM

PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM

Name of Dam: Whites Dam
State: Virginia
County: Albemarle
USGS 7.5 Minute Quadrangle: Crozet, VA
Stream: Lickinghole Creek
Date of Inspection: 8 June 1979

BRIEF ASSESSMENT OF DAM

Whites Dam is an earth dam approximately 300 feet long and 24 feet high. The dam, located approximately one mile northwest of Yancey Mills, Virginia, is used for irrigation. Whites Dam is a "small" size ~ "high" hazard structure as defined by the Recommended Guidelines for Safety Inspection of Dams. Visual inspection and office analyses indicate no deficiencies requiring emergency attention.

Using the Corps of Engineers' screening criteria for initial review of spillway adequacy, the 1/2 Probable Maximum Flood (1/2 PMF) was selected as the spillway design flood (SDF). It was determined that the spillways would pass the 1/2 PMF with 0.7 feet of freeboard. The spillways are therefore considered adequate.

Because this is a high hazard dam with relatively steep embankment slopes, it is recommended that an inspection and stability analyses be performed by a qualified professional engineering firm.

It is recommended that the step-like slumps on the lower half of the downstream embankment be repaired as soon as possible. Proper drainage should also be provided by improving the outlet channel and swampy areas along the toe of dam. Riprap protection should be placed around the outlet pipe. The erosion along the upstream embankment at the waterline should be repaired and riprap should be placed to prevent future erosion. The erosion on the left abutment should be corrected by placing riprap on the eroded area. A well graded crushed stone would provide erosion protection for the road along the crest of the dam. A staff gage should be installed in the reservoir.

NAME OF DAM: WHITES DAM

MICHAEL BAKER, JR., INC.



Michael Baker, III, P.E.
Chairman of the Board and
Chief Executive Officer



SUBMITTED:

Original signed by
JAMES A. WALSH

James A. Walsh
Chief, Design Branch

RECOMMENDED:

ORIGINAL SIGNED BY:

JOHN R. PULPOTT

for Jack G. Starr
Chief, Engineering

APPROVED:

Original signed by:
Douglas L. Haller

Douglas L. Haller
Colonel, Corps of Engineers
District Engineer

Date:

SEP 21 1979

NAME OF DAM: WHITES DAM



OVERALL VIEW OF DAM

PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM
NAME OF DAM: WHITES DAM ID# VA 00327

SECTION 1 - PROJECT INFORMATION

1.1 General

- 1.1.1 Authority: Public Law 92-367, 8 August 1972, authorized the Secretary of the Army, through the Corps of Engineers, to initiate a national program of safety inspections of dams throughout the United States. The Norfolk district has been assigned the responsibility of supervising the inspection of dams in the Commonwealth of Virginia.
- 1.1.2 Purpose of Inspection: The purpose is to conduct a Phase I inspection according to the Recommended Guidelines for Safety Inspection of Dams. The main responsibility is to expeditiously identify those dams which may be a potential hazard to human life or property.

1.2 Description of Project

- 1.2.1 Description of Dam and Appurtenances: Whites Dam is an earth dam approximately 300 feet long and 25 feet high¹. The crest width is approximately 22 feet. The minimum crest of dam, located approximately 50 feet from the left² abutment, is at elevation 759.3 feet Mean Sea Level (M.S.L.)³. The side slopes of the embankment on the upstream side are 2:1 (horizontal to vertical) and approximately 2.5:1 on the downstream side.
- The principal spillway consists of a vertically standing 15 inch diameter corrugated metal pipe with a crest elevation of 753.0 feet M.S.L. A section of 24 inch corrugated metal pipe, 3.5 feet long, is placed on the end of

¹Measured from the streambed at the downstream toe to the embankment crest.

²Facing downstream.

³All elevations listed in this report are referenced to the normal pool elevation of 753.0 feet M.S.L., estimated from the Crozet, Virginia, 7.5 minute USGS quadrangle.

designed by the U.S. Department of Agriculture, Soil Conservation Service (SCS).

- 1.2.8 Normal Operational Procedures: No formal operation procedures are followed for Whites Dam. The reservoir pool is normally maintained at the crest of the principal spillway, elevation 753.0 feet M.S.L.

1.3 Pertinent Data

- 1.3.1 Drainage Area: The drainage area of Whites Dam is 0.18 square mile.

- 1.3.2 Discharge at Dam Site: The maximum discharge from the reservoir is unknown.

Principal Spillway

Pool level at top of dam . . 14 c.f.s.

Emergency Spillway

Pool level at top of dam . . 1220 c.f.s.

- 1.3.3 Dam and Reservoir Data: Pertinent data on the dam and reservoir is shown in the following table:

TABLE 1.1 DAM AND RESERVOIR DATA

| Item | Elevation feet M.S.L. | Area acres | Reservoir Capacity | | Length miles |
|---|--------------------------|---------------|-----------------------|---------------------|-----------------|
| | | | Acre- feet | Watershed inches | |
| Top of dam | 759.3 | 8.2 | 68 | 6.9 | 0.24 |
| Emergency spillway crest | 754.3 | 5.2 | 35 | 3.6 | 0.18 |
| Principal spillway crest (normal pool) | 753.0 | 5.0 | 28 | 2.8 | 0.16 |
| Streambed at downstream toe of dam | 734+ | - | - | - | - |

NAME OF DAM: WHITES DAM

the 15 inch pipe to prevent debris from entering or clogging the spillway (see Plate 2). The 15 inch corrugated metal pipe discharges into a natural plunge pool at the downstream toe of the embankment.

The emergency spillway is a vegetated earth channel located in the right abutment of the dam. The control section of the spillway is 28 feet wide and has a crest elevation of 754.3 feet M.S.L. The spillway channel side slopes vary from 2:1 to 3:1.

A six inch gated pipe, which extends into the reservoir from the principal spillway, is provided for draining the reservoir.

- 1.2.2 Location: Whites Dam is located on the Slabtown Branch of the Lickinghole Creek approximately one mile northwest of Yancey Mills, Albemarle County, Virginia.
- 1.2.3 Size Classification: The maximum height of the dam is 24 feet; the reservoir storage capacity to the crest of the dam, elevation 759.3 feet M.S.L., is 68 acre-feet. Therefore, the dam is in the "small" size category as defined by the Recommended Guidelines for Safety Inspection of Dams.
- 1.2.4 Hazard Classification: Loss of life would be possible in the event of a dam failure since several residents are situated in low-lying areas within one half mile downstream of the dam. The dam is therefore classified in the "high" hazard category as defined in the Recommended Guidelines for Safety Inspection of Dams. The hazard classification used to categorize dams is a function of location only and has nothing to do with its stability or probability of failure.
- 1.2.5 Ownership: The dam is owned by William H. White, P.O. Box 164, Ivy, Virginia 22945.
- 1.2.6 Purpose: The reservoir created by the dam is used for irrigation.
- 1.2.7 Design and Construction History: The dam was constructed in 1971 by Earhart Construction Company. No construction records were available for review. The dam and appurtenances were

NAME OF DAM: WHITES DAM

SECTION 2 - ENGINEERING DATA

- 2.1 Design: No design information for Whites Dam was available for review.
- 2.2 Construction: No construction records, as-built plans, or inspection logs were available for review.
- 2.3 Operation: No operation records are maintained.
- 2.4 Evaluation: No stability analyses or hydrologic and hydraulic data was available for review. No construction records or as-built plans were available to adequately assess the condition of the dam. All evaluations and assessments in this report were based upon field observations and office analysis.

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NAME OF DAM: WHITES DAM

SECTION 3 - VISUAL INSPECTION

3.1 Findings

- 3.1.1 General: The field inspection of Whites Dam was conducted on 8 June 1979 during warm, cloudy weather. The pool level in the reservoir was near normal at the time of the inspection and ground conditions were dry. Although the lower half of the downstream embankment contained step-like slumps which were sparsely vegetated and eroded, the material was firm and no seepage was found. The soils appeared to be silts and clays. The appurtenant structures were found to be in good condition with minor exceptions.

Plate 1 is a Field Sketch of the dam which illustrates the conditions observed during the visual inspection. The complete visual inspection check list is included in Appendix III. Following are summaries of the deficiencies noted during the inspection.

- 3.1.2 Dam: Step-like slumping of the lower half of the downstream slope of the embankment (slope 2.5:1) has occurred at this facility (see Plate 1). Displacements of up to 2 feet along the more distinct slump scarps were noted. Each slump is less than 3 feet in width. The lower half of the slope is sparsely vegetated and the slumped areas are eroded (see Photo 5). The disturbed embankment material is firm and no seeps were detected in the slumped areas. The downstream toe area of the dam on either side of the outlet channel is very swampy, but no seepage was detected. Surface drainage is poor, probably due to the poor condition of the downstream channel, and the vegetation is thick (see Photo 3) in this area.

The crest of the embankment is traversed for its full width by an earth roadway (see Overall View of Dam). Although not provided with an erosion resistant surface, no significant amounts of gulleying were noted.

The upstream slope of the embankment (slope 2:1) at the waterline has eroded badly and sloughed into the water in many places. This

NAME OF DAM: WHITES DAM

has resulted in oversteepening and minor instability. Vegetation is sparse on most of the upstream embankment slope due to continual erosion (see Photo 6).

A one foot deep gully has been eroded by road runoff at the junction of the upstream embankment slope with the left abutment. Very minor erosion of the downstream junction on the left side of the dam has also occurred due to road runoff. This erosion has been minimized by a good grass cover in this area.

- 3.1.3 Appurtenant Structures: The principal spillway outlet is partially inundated due to restriction of flow in the discharge channel near the outlet. The discharge channel is heavily overgrown by high grass. A stilling basin is not provided and riprap is not present around the outlet to protect the toe of the dam (see Photo 2 and 3).

A small stream drains into the discharge channel of the emergency spillway and is depositing minor amounts of sediment at its outlet. Further downstream in the emergency spillway, the discharge channel has been badly eroded and a 3 feet deep gully has formed (see Plate 1). The runoff from the small stream appears to be the reason for the erosion.

- 3.1.4 Reservoir Area: Generally, the slopes around the reservoir are fairly gentle and appear stable. At the water edge, wave action has eroded the slopes, much like the upstream slope of the dam, and low steep scarps have resulted. These scarps are subject to continual minor erosion and sloughing.

- 3.1.5 Downstream Channel: The downstream channel is overgrown by dense grass and drainage is poor, as explained in Sections 3.1.2 and 3.1.3.

- 3.2 Evaluation: Substantial slumping has occurred on the downstream slope of the embankment. Because bulging at the toe of the dam was not observed, it is believed that the depth of disturbance in the embankment is relatively shallow. The toe area of the dam is very swampy, but the lack of detectable flow implies seepage is not occurring through the embankment. This condition

NAME OF DAM: WHITES DAM

could be attributed, at least in part, to the poor drainage conditions in the downstream channel. Seepage may, however, be occurring through the foundation. Seepage is lacking within the slumped areas and the ground surface is firm.

Although the roadway across the dam crest is not surfaced, no significant erosion problem exists. However, it is good practice to provide a well graded crushed stone for erosion protection.

The upstream embankment slope is badly eroded and subject to continual sloughing due to oversteepening.

Although a stilling basin is not provided, riprap should be placed around the outlet pipe to prevent erosion of the downstream toe.

The above items are not considered to represent any emergency situations. They should, however, be addressed in the near future during routine maintenance of the dam.

NAME OF DAM: WHITES DAM

SECTION 4 - OPERATIONAL PROCEDURES

- 4.1 Procedures: Operation of the dam is automatic. Normal pool (elevation 753.0 feet M.S.L.) is maintained by the vertically standing 15 inch diameter corrugated metal pipe (see Photo 1 and Plate 3). In the event that the reservoir level rises above elevation 754.3 feet M.S.L., water will also flow past the dam through the emergency spillway located outside the right abutment.

Drawdown of the reservoir is possible by means of a hand operated valve shown on Photo 1. This drain is capable of completely dewatering the reservoir.

- 4.2 Maintenance of Dam: Maintenance of the dam is the responsibility of the owner. No formal inspection or maintenance schedule has been instituted. As part of general maintenance of the dam, areas of erosion and lack of vegetation should be repaired annually.
- 4.3 Maintenance of Operating Facilities: Maintenance of the reservoir drain is the responsibility of the owner. From available information, the structure for the drain hand crank was reinforced in 1978 because of ice damage. The reservoir was drained to accomplish the repair.
- 4.4 Warning System: At the present time, there is no warning system or evacuation plan in operation. Considering the size of the facility, a formal plan is not considered necessary. However, the owner should work out a program by which the residents immediately downstream can be notified in the event an impending problem is recognized.
- 4.5 Evaluation: Regular inspections should be made of the dam, appurtenant structures, and operating equipment. A thorough check list should be compiled for use by the owner or a representative of the owner as a guide for the inspection. Maintenance items should be corrected annually.

NAME OF DAM: WHITES DAM

SECTION 5 - HYDRAULIC/HYDROLOGIC DATA

- 5.1 Design: No design data was available for use in preparing this report.
- 5.2 Hydrologic Records: No rainfall, stream gage, or reservoir stage records are maintained for this dam.
- 5.3 Flood Experience: No records were available.
- 5.4 Flood Potential Performance of the reservoir by routing the 1/2 Probable Maximum Flood (1/2 PMF) is shown in Table 5.1. The 1/2 PMF was routed by utilizing the U.S. Army Corps of Engineers' Flood Hydrograph Package, HEC-1 DB, and appropriate unit hydrograph, precipitation, and storage-discharge data. Clark's Tc and R coefficients used in the analysis were estimated from basin characteristics. The rainfall applied to the unit hydrograph was obtained from the U.S. Weather Bureau (Reference 5, Appendix V). Rainfall losses were estimated at an initial loss of 1.0 inch and a constant loss thereafter of 0.05 inch per hour.

Reservoir area and storage capacity were determined by use of the 7.5 Minute USGS quadrangle for Crozet, Virginia. Outlet discharge capacity was computed and includes discharges from the principal and emergency spillway. The flood routing was started assuming the reservoir level was at normal pool.

- 5.5 Reservoir Regulation: Pertinent dam and reservoir data is shown in Table 1.1, paragraph 1.3.3.

Regulation of flow from Whites Dam is automatic. The normal pool, elevation 753.0 feet M.S.L., is maintained by the crest of the principal spillway. Excess flood flows are discharged through the emergency spillway when the reservoir rises to levels above 754.3 feet M.S.L. All water discharged from the reservoir flows into the Slabtown Branch of the Lickinghole Creek.

- 5.6 Overtopping Potential: The probable rise in reservoir and other pertinent information on reservoir performance for the 1/2 PMF hydrograph are shown in the following table:

NAME OF DAM: WHITES DAM

TABLE 5.1 RESERVOIR PERFORMANCE

| Item | Normal | Hydrographs | |
|--|----------|-------------|--------|
| | | 1/2 PMF | PMF(a) |
| Peak flow, c.f.s. | | | |
| Inflow | 0.2 | 1130 | 2260 |
| Outflow | 0.2 | 920 | 2260 |
| Peak elev., ft. M.S.L. | 753.0(b) | 758.6 | 760.2 |
| Emergency spillway (c) (elev. 754.3 ft. M.S.L.) | | | |
| Depth of flow, ft. | - | 1.8 | 4.4 |
| Average velocity, f.p.s. | - | 8.0 | 8.2 |
| Duration of overtopping, hr.s | - | 12.7 | 17.2 |
| Non-overflow section (elev. 759.3 ft. M.S.L.) | | | |
| Depth of flow, ft. | - | - | 0.9 |
| Average velocity, f.p.s. | - | - | 2.5 |
| Duration of overtopping, hrs. | - | - | 0.5 |
| Tailwater elev., ft. M.S.L. | 733.9(d) | - | - |

- (a) The PMF is an estimate of flood discharges that may be expected from the most severe combination of critical meteorologic and hydrologic conditions that are reasonably possible in a region.
- (b) All elevations are referenced to the normal pool elevation of 753.0 feet, estimated from the Crozet, Virginia, 7.5 minute USGS quadrangle.
- (c) Depth and velocity estimates were based on critical depth at control section.
- (d) Tailwater at time of inspection.

5.7 Reservoir Emptying Potential: The reservoir can be drawdown by means of the gated 6 inch corrugated metal pipe which extends upstream from the principal spillway inlet. Neglecting inflow, the reservoir can be drawdown from normal pool in approximately 12 days.

5.8 Evaluation: Whites Dam is a "small" size - "high" hazard dam requiring evaluation for a spillway design flood (SDF) equal to the 1/2 PMF to the Probable Maximum Flood (PMF). The 1/2 PMF was selected as the SDF and routed through the reservoir. It was determined that the spillways would pass the 1/2 PMF without overtopping the dam. In fact, the spillways will pass approximate 65 percent of the PMF.

Conclusions pertain to present day conditions and the effect of future development on the hydrology has not been considered.

NAME OF DAM: WHITES DAM

SECTION 6 - DAM STABILITY

6.1 Foundation and Abutments: No information is available concerning the specific nature of the foundation and abutments. Bedrock outcrops should consist of Precambrian igneous and metamorphic rock of the Virginia Blue Ridge complex.

6.2 Stability Analysis

6.2.1 Visual Observations: Slumping has occurred on portions of the lower half of the downstream slope of the embankment (see Photo 5). The displacement is approximately 2 feet. The slumped areas are eroded and sparsely vegetated, but the silty and clayey soils are firm and no seepage was observed. The toe area of the dam is swampy, but a concentrated discharge was not detected.

The upstream slope of the embankment is somewhat eroded and has been slightly undercut for a 2 foot height at the waterline resulting in sloughing of the embankment into the water (see Photo 6).

6.2.2 Design and Construction Data: No design data was available for this evaluation. The field inspection revealed that the crest width of the dam is 22 feet. The upstream slope ratio is 2:1 and the downstream slope ratio is 2.5:1.

6.2.3 Operating Records: Operating records have not been maintained for this facility.

6.2.4 Post-Construction Changes: There has been no known post-construction changes.

6.2.5 Seismic Stability: Whites Dam is situated in Seismic Zone 2, and is considered to have no hazard from earthquakes according to the Recommended Guidelines for Safety Inspection of Dams, provided static stability conditions are satisfactory and conventional safety margins exist.

6.3 Evaluation: Though slumping of the downstream embankment is present, overall dam instability is not suspected.

NAME OF DAM: WHITES DAM

The downstream embankment slope ratio of 2.5:1 is considered to be satisfactory under normal conditions. However, the 2:1 upstream slope ratio appears to be overly steep considering the lack of riprap and the sloughing that has occurred. Improving drainage conditions in the downstream channel and regrading the slumped areas, as described in Section 7.2, should satisfactorily restore the condition of the downstream embankment slope.

NAME OF DAM: WHITES DAM

SECTION 7 - ASSESSMENT/REMEDIAL MEASURES

- 7.1 Dam Assessment: The dam and appurtenant structures are generally in satisfactory condition. No deficiencies were discovered during the field inspection and office analyses which would require emergency attention.

Using the Corps of Engineers' screening criteria for the initial review of spillway adequacy, the 1/2 PMF was selected as the SDF for the "small" size - "high" hazard classification of Whites Dam. The spillways will pass the 1/2 PMF with 0.7 feet of freeboard. The spillways are therefore considered adequate.

The lower half of the downstream embankment has step-like slumps which should be corrected to prevent further deterioration. The exposed portion of the upstream embankment is eroding from wave action and will worsen if not corrected. With the exception of these deficiencies, the embankment is in satisfactory condition with no seepage observed during the field inspection.

- 7.2 Recommended Remedial Measures: Because this is a high hazard dam with relatively steep embankment slopes, it is recommended that an investigation and stability analyses be performed by a qualified professional engineering firm. It is recommended that the step-like slumps on the lower half of the downstream embankment slope be repaired as soon as possible to prevent further deterioration. The slump area should be graded, filled where necessary, compacted, and seeded. The discharge channel from the outlet pipe should be improved to allow drainage away from the outlet pipe and the swampy areas along the toe of the dam. Riprap protection should be placed around the outlet pipe. The erosion along the waterline of the upstream embankment slope should be repaired and riprap should be placed on the slope to protect it from further erosion.

As part of the general maintenance of the dam, the runoff from the roadway, which is eroding the junction of the embankment with the left upstream abutment, should be diverted. The gulleys, which are presently about 1 foot deep, should be repaired and riprap protection provided. A well graded crushed stone placed on the crest of the dam would provide protection against erosion. A staff gauge should be installed to monitor reservoir levels above normal pool.

NAME OF DAM: WHITES DAM

APPENDIX I

PLATES

CONTENTS

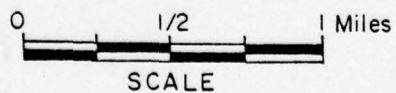
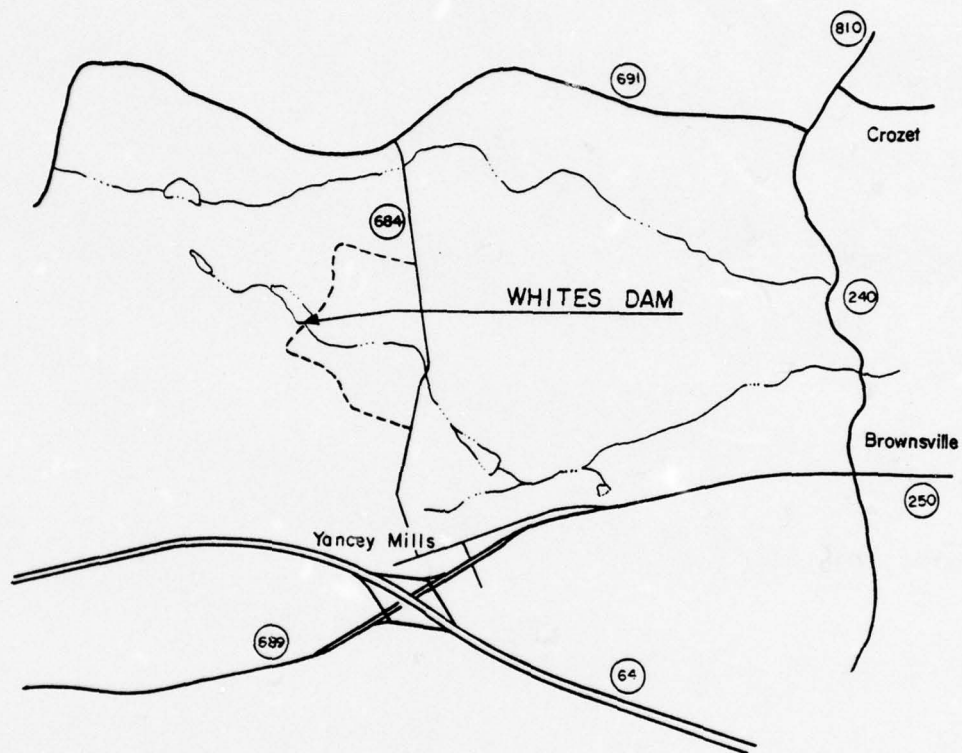
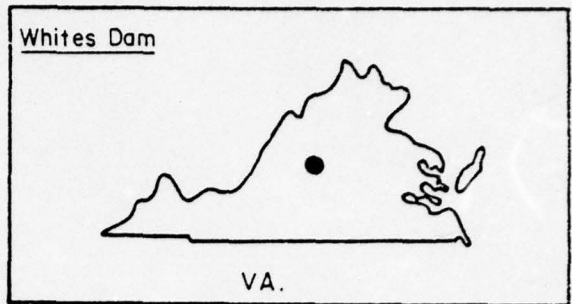
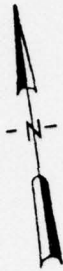
Location Plan

Plate 1: Field Sketch

Plate 2: Typical Dam Cross Section

Plate 3: General Configuration of Principal Spillway
Inlet

NAME OF DAM: WHITES DAM



LOCATION PLAN
WHITES DAM

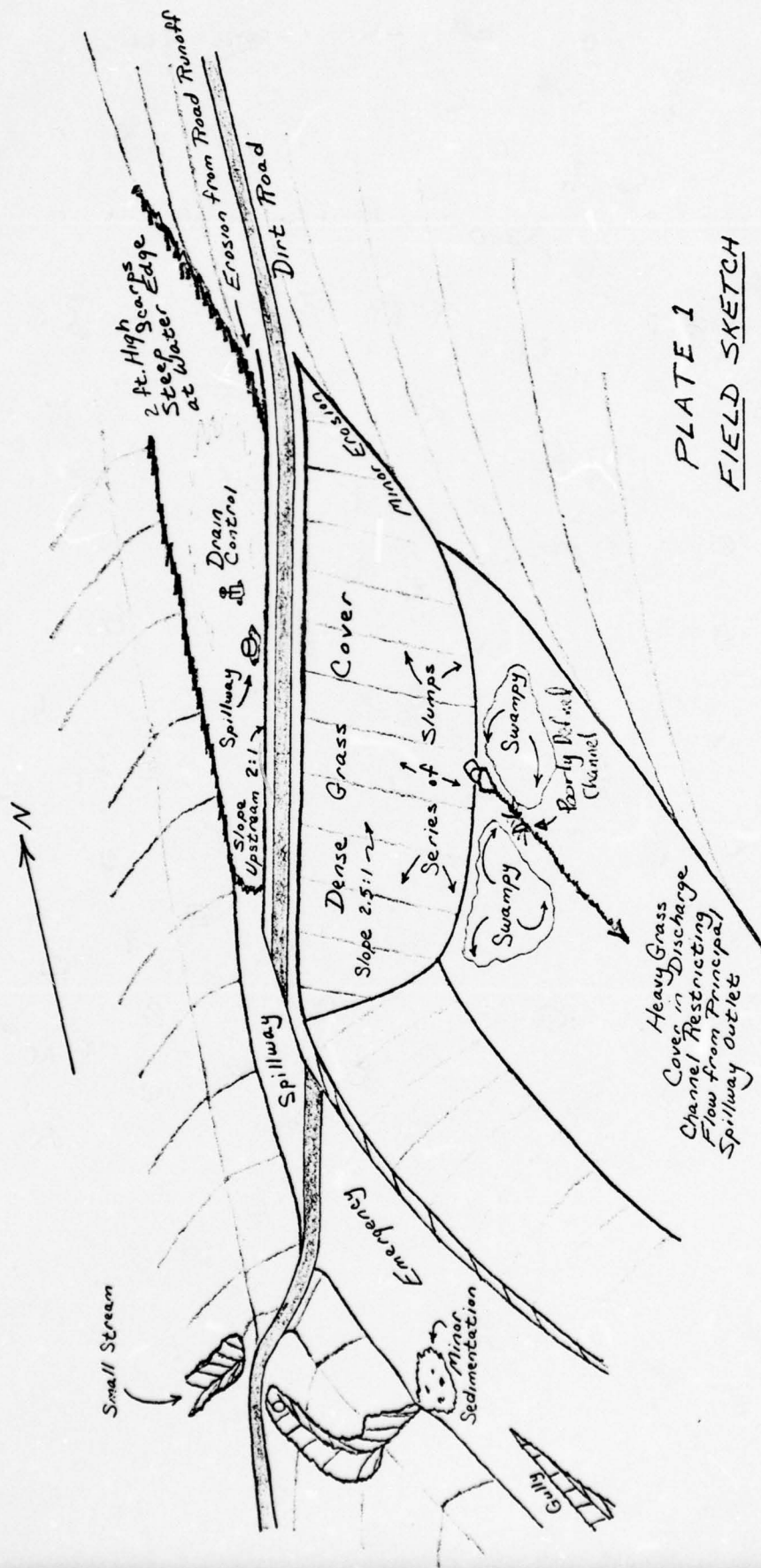


PLATE 1

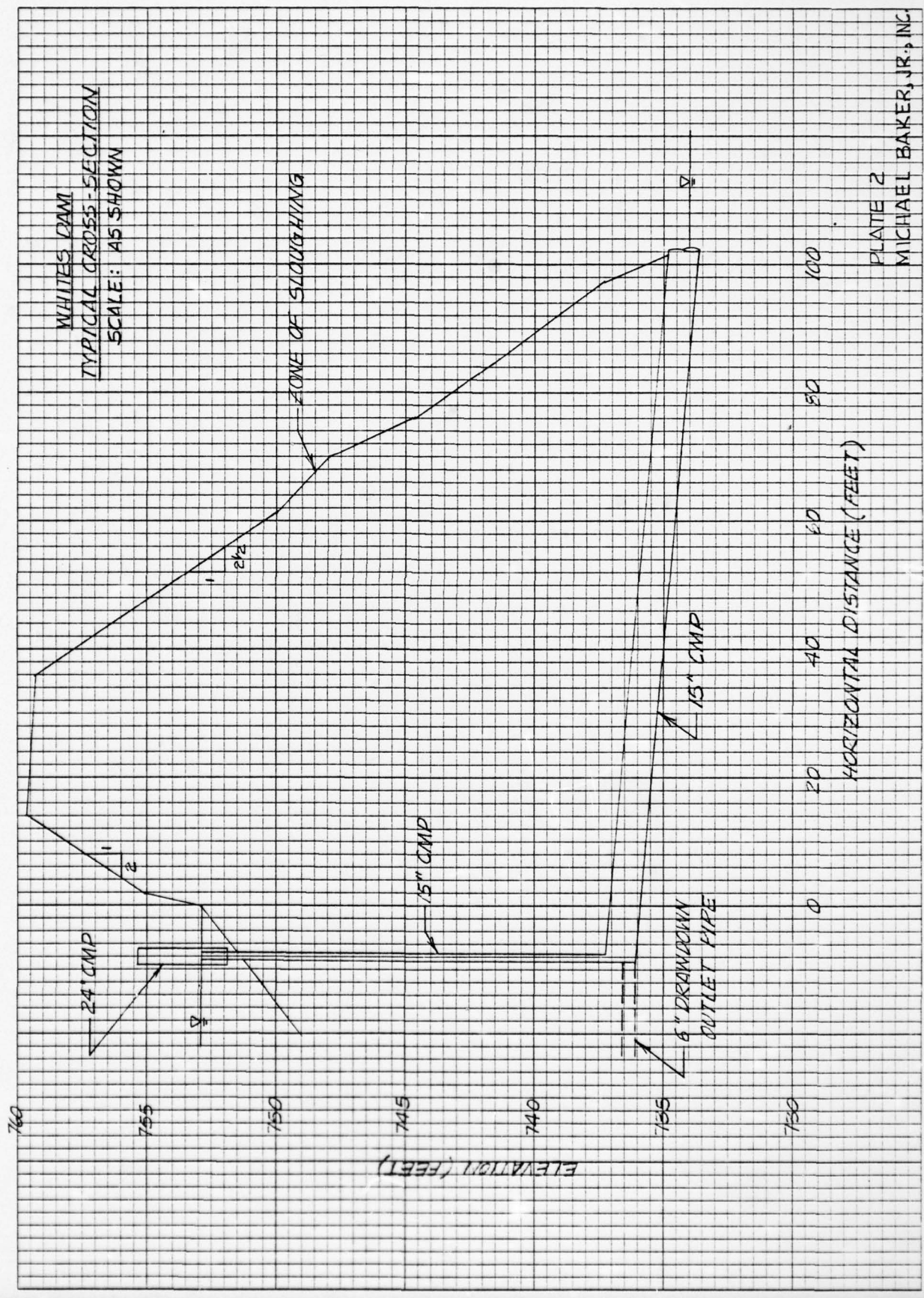
FIELD SKETCH

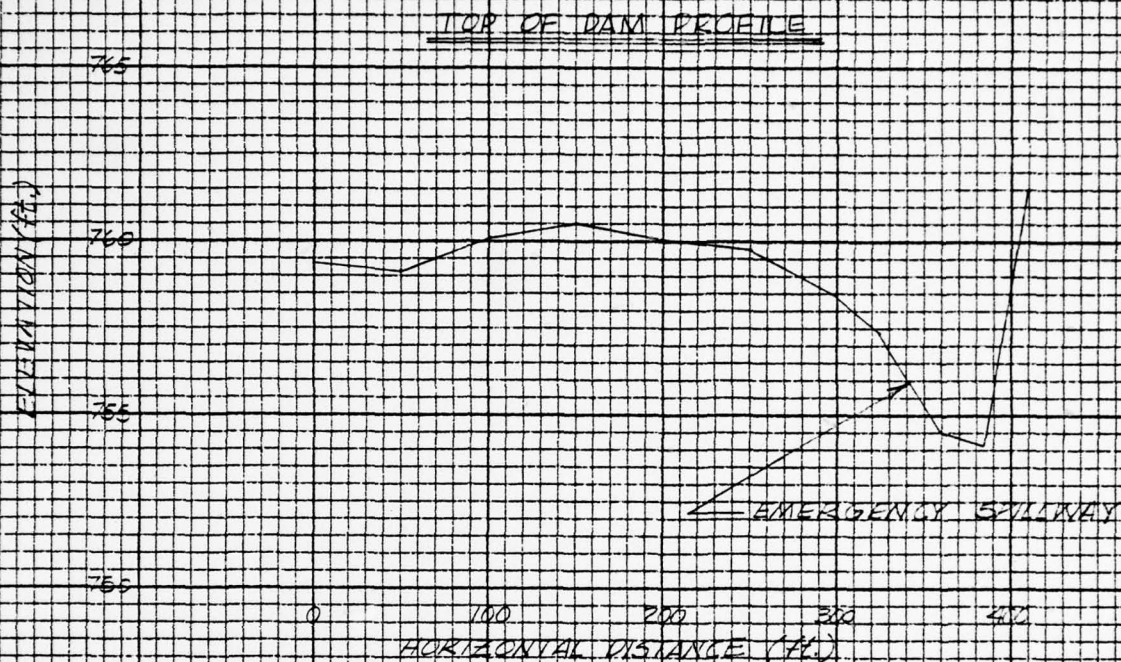
WHITES DAM, VIRGINIA

Michael Baker, Jr., Inc.

8 June 1979

- No Scale -





NOTE: THE ABOVE DATA WAS TAKEN AT THE TIME OF THE FIELD INSPECTION.

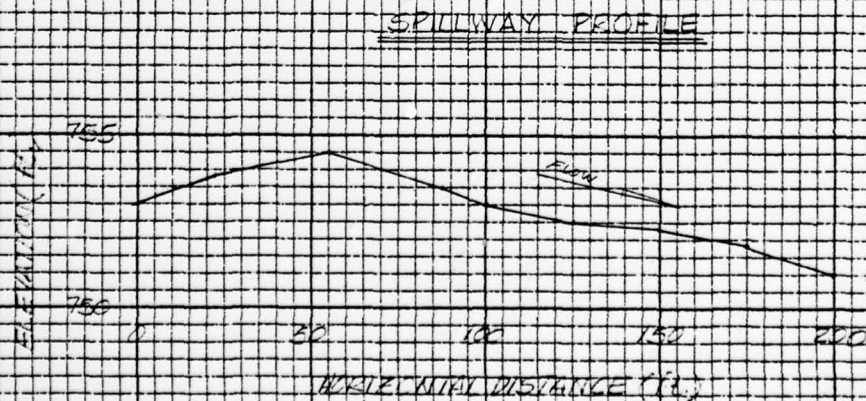


PLATE 3
WHITES DAM
TOP OF DAM AND SPILLWAY
PROFILE
MICHAEL BAKER, JR., INC.
SCALE: AS SHOWN

APPENDIX II

PHOTOGRAPHS

CONTENTS

- Photo 1: Principal Spillway Inlet and Drain Hand Crank
- Photo 2: Principal Spillway Outlet and Restricted Discharge Channel
- Photo 3: View of Downstream Channel from Dam Crest
- Photo 4: Downstream View of Emergency Spillway Channel
- Photo 5: Eroded Slump Scarps on the Downstream Embankment
- Photo 6: Erosion and Sloughing of the Upstream Embankment

Note: Photographs were taken on 8 June 1979.

NAME OF DAM: WHITES DAM

WHITES DAM



PHOTO 1. Principal Spillway Inlet and Drain Hand Crank



PHOTO 2. Principal Spillway Outlet and Restricted Discharge Channel

WHITES DAM



PHOTO 3. View of Downstream Channel from Dam Crest



PHOTO 4. Downstream View of Emergency Spillway Channel

WHITES DAM



PHOTO 5. Eroded Slump Scarps on the Downstream Embankment



PHOTO 6. Erosion and Sloughing of the Upstream Embankment

APPENDIX III

CHECK LIST - VISUAL INSPECTION

Check List
Visual Inspection
Phase 1

Name of Dam Whites Dam County Albemarle State Virginia Coordinates Lat. 3803.5
Long. 7844.0

Date Inspection 8 June 1979 Weather Cloudy Temperature 75°F.

Pool Elevation at Time of Inspection 753.0 ft. M.S.L. Tailwater at Time of Inspection 733.9 ft. M.S.L.

III-1

Inspection Personnel:

Michael Baker, Jr., Inc.:

T. W. Smith
R. D. Holderbaum
D. W. Hupe

Virginia Water Control Board:

Hugh Gildea

Owner's Representatives:

William White
William White, Jr.
Steve White

D. W. Hupe Recorder

EMBANKMENT

Name of Dam: WHITES DAM

| VISUAL EXAMINATION OF | OBSERVATIONS | REMARKS OR RECOMMENDATIONS |
|--|--|---|
| SURFACE CRACKS | None observed | |
| UNUSUAL MOVEMENT OR CRACKING AT OR BEYOND THE TOE | None observed | |
| SLOUGHING OR EROSION OF EMBANKMENT AND ABUTMENT SLOPES | <p>The lower half of the downstream embankment consists of a series of step-like slumps. The steep slump scarps indicate displacements of approximately 2 ft. These slumps are eroding and are sparsely vegetated. The ground surface is firm in the slumped areas.</p> <p>The upstream embankment is badly eroded at the waterline. A steep scarp approximately 2 ft. high has formed and slumping of the embankment has occurred to the water.</p> | <p>The downstream embankment should be regraded, filled and compacted where necessary. The area should then be seeded and mulched.</p> <p>Riprap is needed on the upstream embankment along the waterline to stop erosion and slumping.</p> |
| VERTICAL AND HORIZONTAL ALIGNMENT OF THE CREST | The crest of the dam varies approximately 1 ft. in elevation along its length; no significant variation in the horizontal alignment was observed. | |
| RIPRAP FAILURES | Riprap was not used on the dam. | |

EMBANKMENT

Name of Dam: WHITES DAM

| VISUAL EXAMINATION OF | OBSERVATIONS | REMARKS OR RECOMMENDATIONS |
|-----------------------|--------------|----------------------------|
|-----------------------|--------------|----------------------------|

JUNCTION OF EMBANKMENT
AND ABUTMENT, SPILLWAY
AND DAM

The upstream left junction of the embankment with the abutment has been eroded by road runoff. A 1 ft. deep gully has formed. The downstream left junction has also been slightly eroded by road runoff, but it is well vegetated. The downstream right junction is in satisfactory condition.

The road runoff which is affecting the upstream left junction should be diverted. The eroded gully should be filled and reseeded.

ANY NOTICEABLE SEEPAGE

There is a swampy area at the toe of the dam, however, there is no apparent flow through the embankment.

This may represent seepage through the foundation. Slight regrading should be conducted at the toe of the dam to improve drainage.

STAFF GAGE AND RECORDER

None observed

A staff gage should be installed.

DRAINS

None observed

OUTLET WORKS

Name of Dam: WHITES DAM

| VISUAL EXAMINATION OF | OBSERVATIONS | REMARKS OR RECOMMENDATIONS |
|-----------------------|---|--|
| OUTLET CONDUIT | Most of the outlet conduit could not be observed; it appeared to be in good condition at its entrance and exit. | |
| INTAKE STRUCTURE | Some siltation around the riser intake was observed. No other problems were noted. | The sediment should be removed from around the intake to prevent blockage of the structure. |
| OUTLET STRUCTURE | The outlet pipe is partially inundated due to the restricted condition of the outlet channel. | This condition is contributing to the swampy condition at the toe of the dam. |
| OUTLET CHANNEL | The outlet channel is restricted by weedy vegetation. There is no definite stilling basin. | The outlet channel should be cleared in the vicinity of the outlet pipe and downstream to lower the water level with respect to the outlet pipe. |
| EMERGENCY GATE | A hand operated control which operates a valve to drain the reservoir is situated upstream of the principal spillway inlet. | The valve is not checked regularly to determine its operation. |

UNGATED SPILLWAY

Name of Dam: WHITES DAM

| VISUAL EXAMINATION OF | OBSERVATIONS | REMARKS OR RECOMMENDATIONS |
|-----------------------|----------------|----------------------------|
| CONCRETE WEIR | Not Applicable | |

APPROACH CHANNEL The emergency spillway approach channel is clear and partially grass covered.

DISCHARGE CHANNEL The emergency spillway discharge channel is grass covered and clear. A small stream which flows onto the right side of the discharge channel is depositing minor amounts of sediment as it empties into the channel. This stream is also responsible for a deep (3 ft.) gully which has formed in the discharge channel immediately downstream.

The gully which has formed in the discharge channel does not endanger the dam.

BRIDGE AND PIERS Not Applicable

INSTRUMENTATION

Name of Dam: WHITES DAM

| <u>VISUAL EXAMINATION</u> | <u>OBSERVATIONS</u> | <u>REMARKS OR RECOMMENDATIONS</u> |
|---------------------------|---------------------|---|
| MONUMENTATION/SURVEYS | | Monuments are not present. Recent surveys have not been made. |
| OBSERVATION WELLS | None observed | |
| WEIRS | None observed | |
| PIEZOMETERS | None observed | |
| OTHER | | |

RESERVOIR

Name of Dam: WHITES DAM

| VISUAL EXAMINATION OF | | OBSERVATIONS | REMARKS OR RECOMMENDATIONS |
|-----------------------|---|--------------|----------------------------|
| SLOPES | The surrounding topography is gently sloping. Steep scarps, generally less than 2 ft. high, are present at the water edge around the reservoir. | | |
| SEDIMENTATION | Minor sedimentation has occurred where the reservoir slopes and the downstream embankment have slumped into the water. Sedimentation is also occurring near the left upstream corner of the dam due to the road runoff and the erosion of the junction between the embankment and the abutment. | | |
| | | | |
| | | | |
| | | | |

DOWNSTREAM CHANNEL

Name of Dam: WHITES DAM

| VISUAL EXAMINATION OF | OBSERVATIONS | REMARKS OR RECOMMENDATIONS |
|---|--|----------------------------|
| CONDITION (OBSTRUCTIONS, DEBRIS, ETC.) | The channel immediately downstream of the dam is covered with grass but generally unobstructed. | |
| SLOPES | Stream slope downstream of the dam is approximately 1%. The stream slopes are covered with grass and generally stable. | |
| APPROXIMATE NO. OF HOMES AND POPULATION | The nearest homes are located approximately 0.5 mi. downstream of the dam with an estimated population of 8. | |

APPENDIX IV

CHECK LIST - ENGINEERING DATA

CHECK LIST
ENGINEERING DATA
DESIGN, CONSTRUCTION, OPERATION

Name of Dam: WHITES DAM

| <u>ITEM</u> | <u>REMARKS</u> |
|-------------|----------------|
|-------------|----------------|

| | |
|-------------|--|
| PLAN OF DAM | A Plan of Dam was not available. A Field Sketch of the facility is included in this report as Plate 1. |
|-------------|--|

| | |
|-----------------------|--|
| REGIONAL VICINITY MAP | The vicinity map is presented in this report as the Location Plan. |
|-----------------------|--|

| | |
|----------------------|---|
| CONSTRUCTION HISTORY | The dam was designed by the SCS. The dam was constructed by Earhart Construction Co. and completed in 1971. |
|----------------------|---|

IV-1
TYPICAL SECTIONS OF DAM A typical section of the dam has been compiled and is included in this report as Plate 2.

| | |
|---------------------------|---------------|
| HYDROLOGIC/HYDRAULIC DATA | Not available |
|---------------------------|---------------|

| | |
|----------------|---|
| OUTLETS - PLAN | The configuration of the principal spillway inlet is illustrated on Plate 3 of this report. |
|----------------|---|

- DETAILS

- CONSTRAINTS

- DISCHARGE RATINGS Not available

| | |
|----------------------------|--|
| RAINFALL/RESERVOIR RECORDS | No rainfall or reservoir records are available at the dam. |
|----------------------------|--|

Name of Dam: WHITES DAM

| ITEM | REMARKS |
|------|---------|
|------|---------|

| | |
|----------------|----------------|
| DESIGN REPORTS | None available |
|----------------|----------------|

| | |
|-----------------|----------------|
| GEOLOGY REPORTS | None available |
|-----------------|----------------|

| | |
|---|----------------|
| DESIGN COMPUTATIONS HYDROLOGY & HYDRAULICS DAM STABILITY SEEPAGE STUDIES | None available |
|---|----------------|

| | |
|---|----------------|
| MATERIALS INVESTIGATIONS BORING RECORDS LABORATORY FIELD | None available |
|---|----------------|

| | |
|----------------------------------|--|
| POST-CONSTRUCTION SURVEYS OF DAM | No known post-construction surveys were found. |
|----------------------------------|--|

| | |
|----------------|---------------------------------|
| BORROW SOURCES | The borrow sources are unknown. |
|----------------|---------------------------------|

Name of Dam: WHITES DAM

| ITEM | REMARKS |
|------|---------|
|------|---------|

| | |
|--------------------|--------------|
| MONITORING SYSTEMS | None present |
|--------------------|--------------|

MODIFICATIONS None

HIGH POOL RECORDS None available

IV-3
POST-CONSTRUCTION ENGINEERING None
STUDIES AND REPORTS

PRIOR ACCIDENTS OR FAILURE OF DAM None available
DESCRIPTION
REPORTS

MAINTENANCE The reservoir drain hand crank structure was reinforced in 1978 because of damage from ice
OPERATION during the previous winter.
RECORDS

Name of Dam: WHITES DAM

| <u>ITEM</u> | <u>REMARKS</u> |
|-------------|----------------|
|-------------|----------------|

| | |
|-----------------|--|
| SPILLWAY PLAN , | |
|-----------------|--|

SECTIONS,
and
DETAILS

None available. Plate 1 illustrates the general configuration of the emergency spillway.

| | |
|--|----------------|
| OPERATING EQUIPMENT PLANS & DETAILS | None available |
|--|----------------|

APPENDIX V

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GENERAL REFERENCES

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NAME OF DAM: WHITES DAM

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